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Sujan et al.

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(54) **MILD HYBRID POWERTRAIN CONTROLS**

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(58) **Field of Classification Search**

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See application file for complete search history.

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(57) **ABSTRACT**

Mild hybrid powertrain controls and apparatuses, methods and systems including the same are disclosed. One exemplary embodiment is a mild-hybrid system comprising an engine, an electrical machine, power electronics, an energy storage system, and an electrical load. The system includes a controller structured to receive an electrical machine power command based upon a power allocation to the electrical machine, process the electrical machine power command with feedforward controls structured to compensate for an inaccuracy associated with the power electronics, process the electrical machine power command with proportional integral (PI) controls structured to compensate for a power loss associated with one or more electrical loads, provide a compensated machine power command based upon the processing with the feedforward controls and the processing with the PI controls, and output the compensated machine power command to control the electrical machine.

23 Claims, 4 Drawing Sheets